LIGHTNING PERFORMANCE OF SRI LANKAN TRANSMISSION LINES: A CASE STUDY

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Abstract

The case study is carried out on three important transmission lines of the Ceylon Electricity Board, which transmits hydro generation of Mahaweli complex and Laxapana complex to the load centre. Hence any interruption of these two lines are critical, both system wise and economically.

A transmission line model is implimented in Microsoft Excel which takes the parameters such as tower geometry, conductor information, Insulator string sizes, spans, earth resistance and Isokeraunic level as inputs and calculates the annual shielding failure rate and the back flashover rate of these transmission lines. The calucIations are repeated at different earth resistances and tower heights to simulate the variation encountered in an actual line.

The results are then compared with the transmission line trip records to access the actual performance. Further the calculated backflashover values are corrected using different tower heights encountered along the line route. Also the distribution of earth resistance values are studied.

After analysis, it is found that the line failures also vary with isokeraunic level. The model provided results compareable with the observations in the 220kV line. The shielding of the tower design is acceptable with improvements to the footing resistance, where the values are very high.